Space Weather Forecast

Issued on Thursday, 18 July 2024 at 01:14 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

---

Space Weather Forecast Headline: High to Moderate activity, with further Moderate class flares expected, and a chance of Strong class flares. Chance of G1 Minor Storms late day 2 or more likely day 3 (19-20 Jul) due to CME arrival

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate with a Moderate flare (M-class) observed at 17/0639UTC from a complex sunspot region in the southwest quadrant. There are currently eighteen sunspots on the Earth-facing disc, most of which are generally small and relatively simple, with the largest and most complex region now residing in the southeast quadrant. However, a large and complex sunspot which has recently rotated off the west limb, could still produce significant flares for the next 24 hours.

A series of coronal mass ejections (CMEs) were observed. The first, was comprised of two components. The first, a weak "halo" CME straight towards Earth, and the second to the northeast. These have both been attributed to the Moderate flare at 16/2206UTC. These are both Earth-directed but rather slow, and of uncertain impact, likely arriving very late on day 2 (19 Jul) or early day 3 (20 Jul). A further CME likely also likely occurred with the later Moderate flare, however available imagery currently remains inconclusive. A prominence eruption (arc of plasma) occurred off the southeast limb at 17/1900UTC, which also produced a CME, although given its location, this is unlikely to have any Earth-directed component.

Solar Wind / Geomagnetic Activity: The solar wind was at background levels, ranging between 340-390 km/s. The Interplanetary magnetic field (IMF), Bt, was initially moderate, but declined to the current weak levels. The all-important north-south component (Bz), varied weakly. Geomagnetic activity was Quiet throughout (Kp 0-2).

Solar Radiation: The count rate of energetic particles (High energy protons) remained at background with no solar radiation storms occurring

Four-Day Space Weather Forecast Summary

Solar Activity: High to Moderate activity with further Moderate class flares likely, and a chance of Strong-class flares, mainly on day 1-2 (17-18 Jul)

Solar Wind /Geomagnetic Activity: The CMEs from the Moderate flare at 16/2206 UTC have been assessed as Earth-directed, likely arriving late on day 2 or early day 3 (19-20 Jul). Any fast wind from the large northern coronal hole is most likely to remain north of Earth, but with the potential for slight enhancements day 1-2 (18-19 Jul), with a chance of brief spells of slightly elevated winds. Geomagnetic activity is expected to be mostly Quiet to Unsettled, but with a slight chance of Active and very slight chance of G1 Minor Storm intervals days 1-2 (18-19 Jul). Any CME arrival is then expected to increase activity to Active with likelihood of G1-G2 Minor to Moderate Storm intervals, most likely late on day 2 or day 3 (19-20 Jul). Becoming mostly Quiet

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.

to Unsettled by day 4 (21 Jul), with chance of Active intervals, especially at first.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is likely to remain at background with no solar radiation storms expected. However, any notable flares will bring the potential for this to rise, with a slight chance of reaching the S1 Minor Solar Radiation Storm level.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	5	20	60	20
Strong	G3	No	1	1	5	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	70	70	70	60
Very Active	R3 to R5 X	No	15	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	10	10	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

Issued by Met Office Space Weather Advisor, Tel: +44 (0) 330 135 4254 Email: moswoc@metoffice.gov.uk

© Crown Copyright 2024. All Rights Reserved.